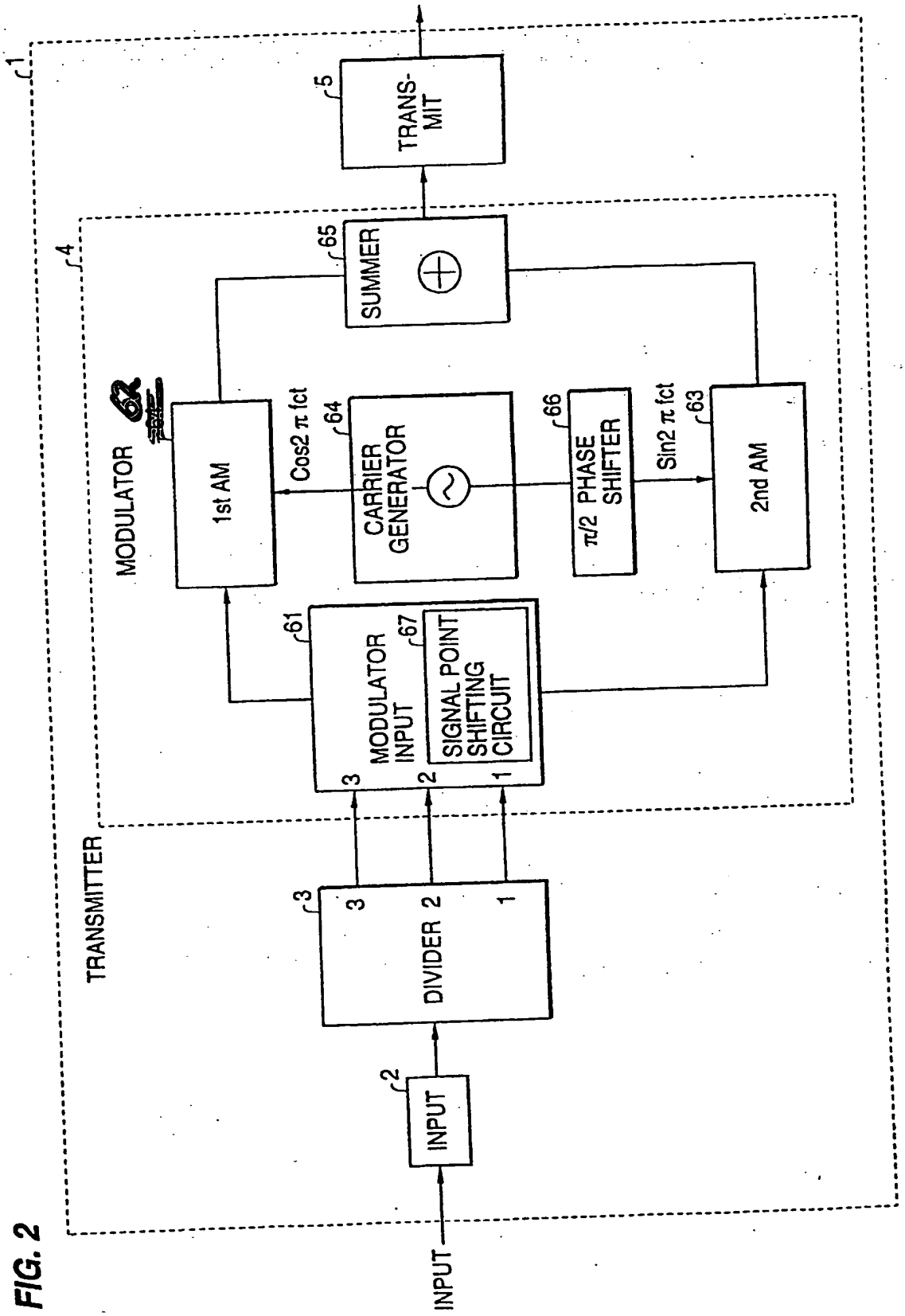
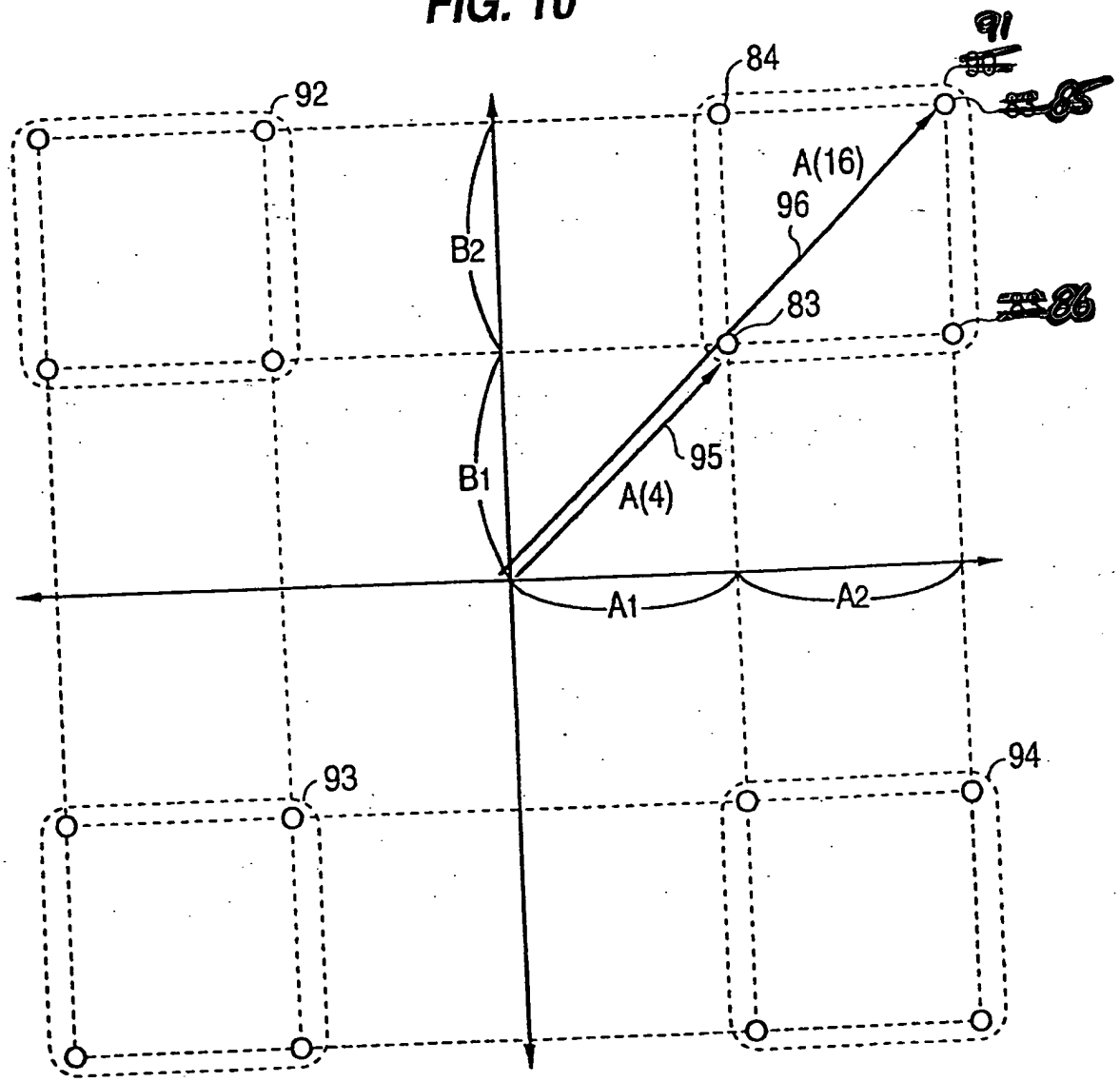

1
TRANSMITTER
4
MODULATOR
1st AM
Cos2 π fct
64
CARRIER GENERATOR
66
π/2 PHASE SHIFTER
Sin2 π fct
63
2nd AM
65
SUMMER
5
TRANS-MIT
61
MODULATOR INPUT
67
SIGNAL POINT SHIFTING CIRCUIT
3
2
1
3
DIVIDER 2
3
2
1
2
INPUT
INPUT

FIG. 2

FIG. 10



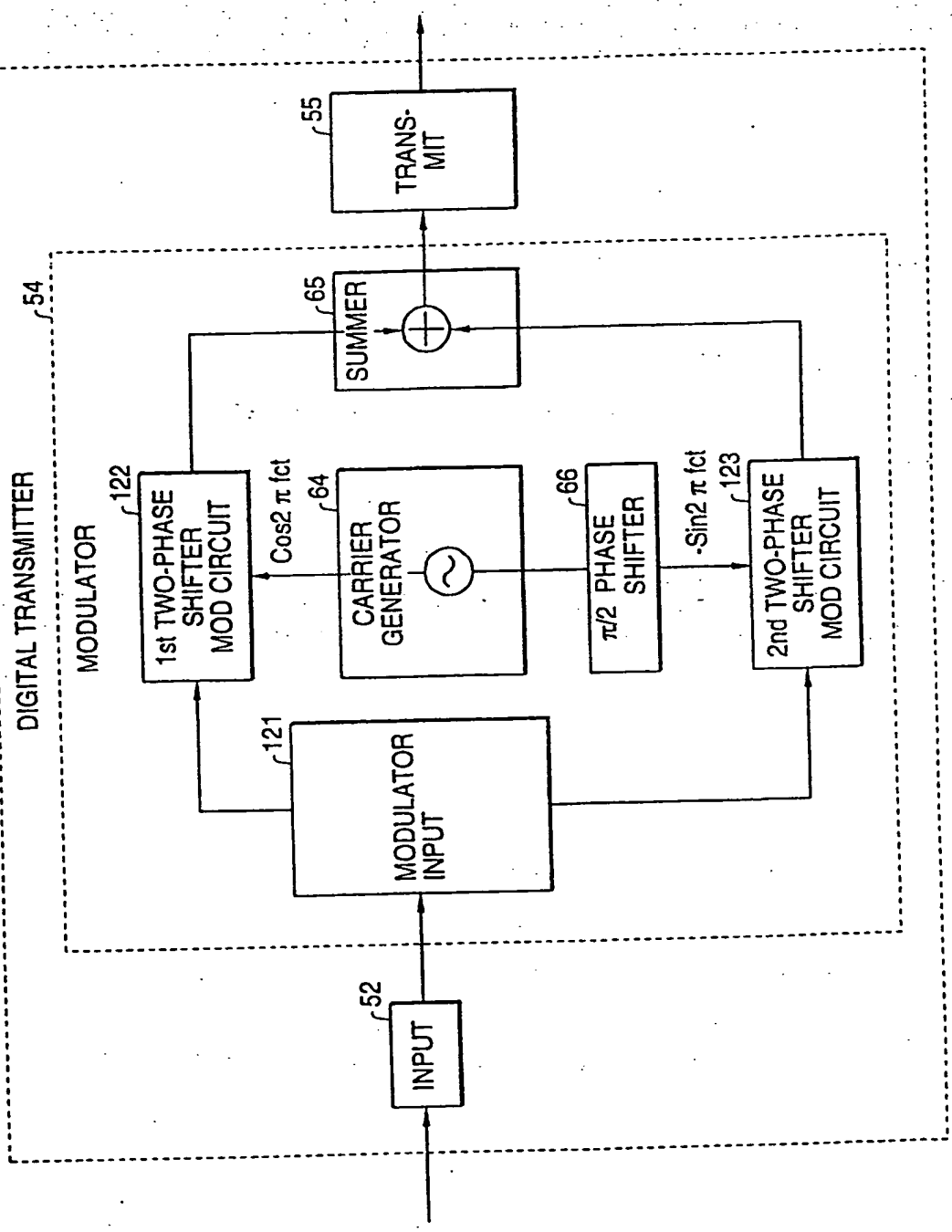

51
DIGITAL TRANSMITTER
54
MODULATOR
55
TRANS-MIT
65
SUMMER
122
1st TWO-PHASE SHIFTER MOD CIRCUIT
Cos2 π fct
64
CARRIER GENERATOR
66
π/2 PHASE SHIFTER
-Sin2 π fct
123
2nd TWO-PHASE SHIFTER MOD CIRCUIT
121
MODULATOR INPUT
52
INPUT

FIG. 17

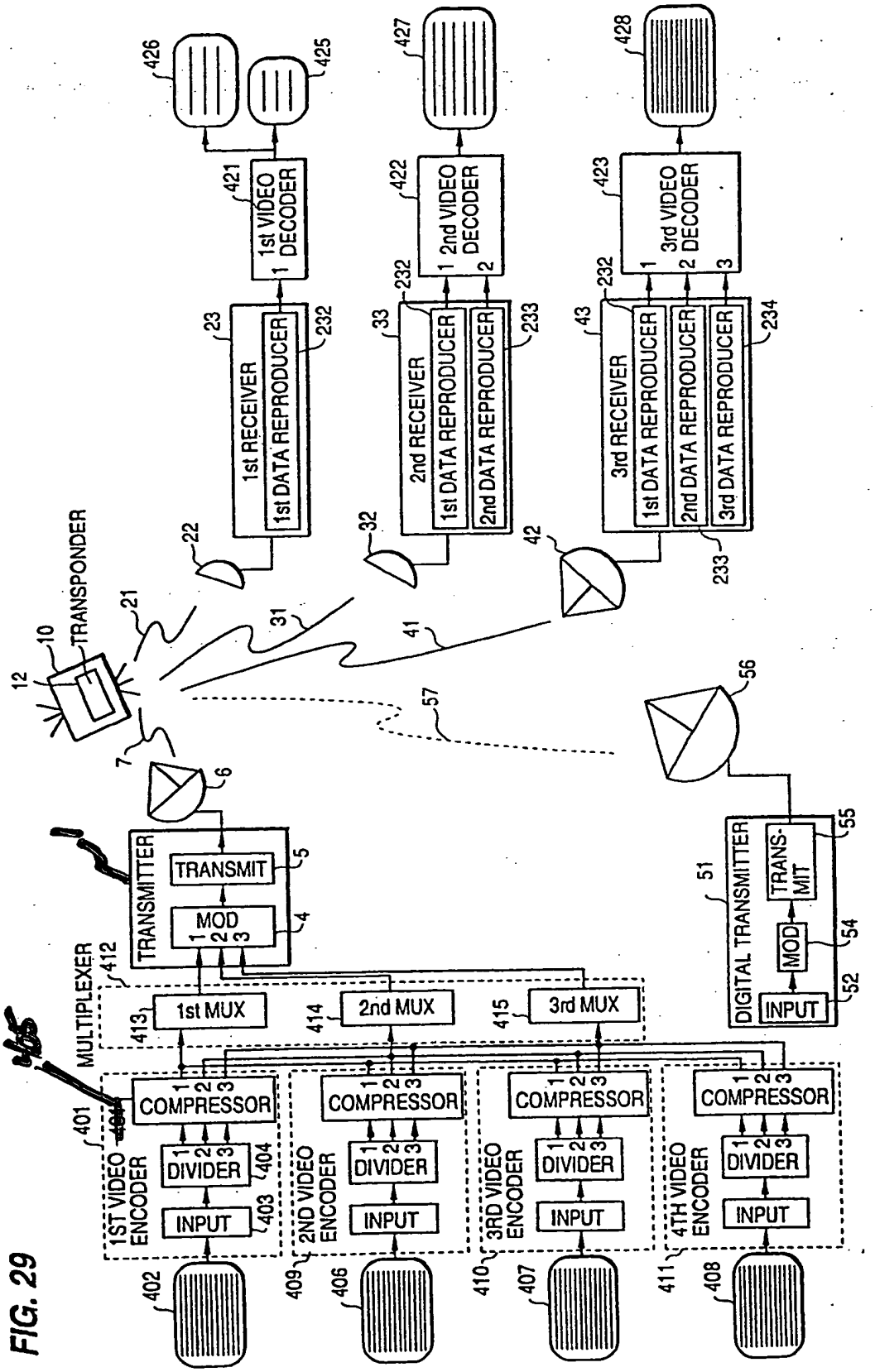

TRANSPONDER
10
12
21
22
31
32
41
42
56
57
7
6
TRANSMITTER
TRANSMIT
MOD
1 2 3
4
5
MULTIPLEXER
412
1st MUX
2nd MUX
3rd MUX
413
414
415
401
COMPRESSOR
DIVIDER
INPUT
403
404
1ST VIDEO ENCODER
2ND VIDEO ENCODER
3RD VIDEO ENCODER
4TH VIDEO ENCODER
402
406
407
408
409
410
411
1st RECEIVER
1st DATA REPRODUCER
2nd RECEIVER
2nd DATA REPRODUCER
3rd RECEIVER
3rd DATA REPRODUCER
23
33
43
232
233
234
1st VIDEO DECODER
2nd VIDEO DECODER
3rd VIDEO DECODER
421
422
423
425
426
427
428
DIGITAL TRANSMITTER
TRANS-MIT
51
52
54
55

FIG. 29

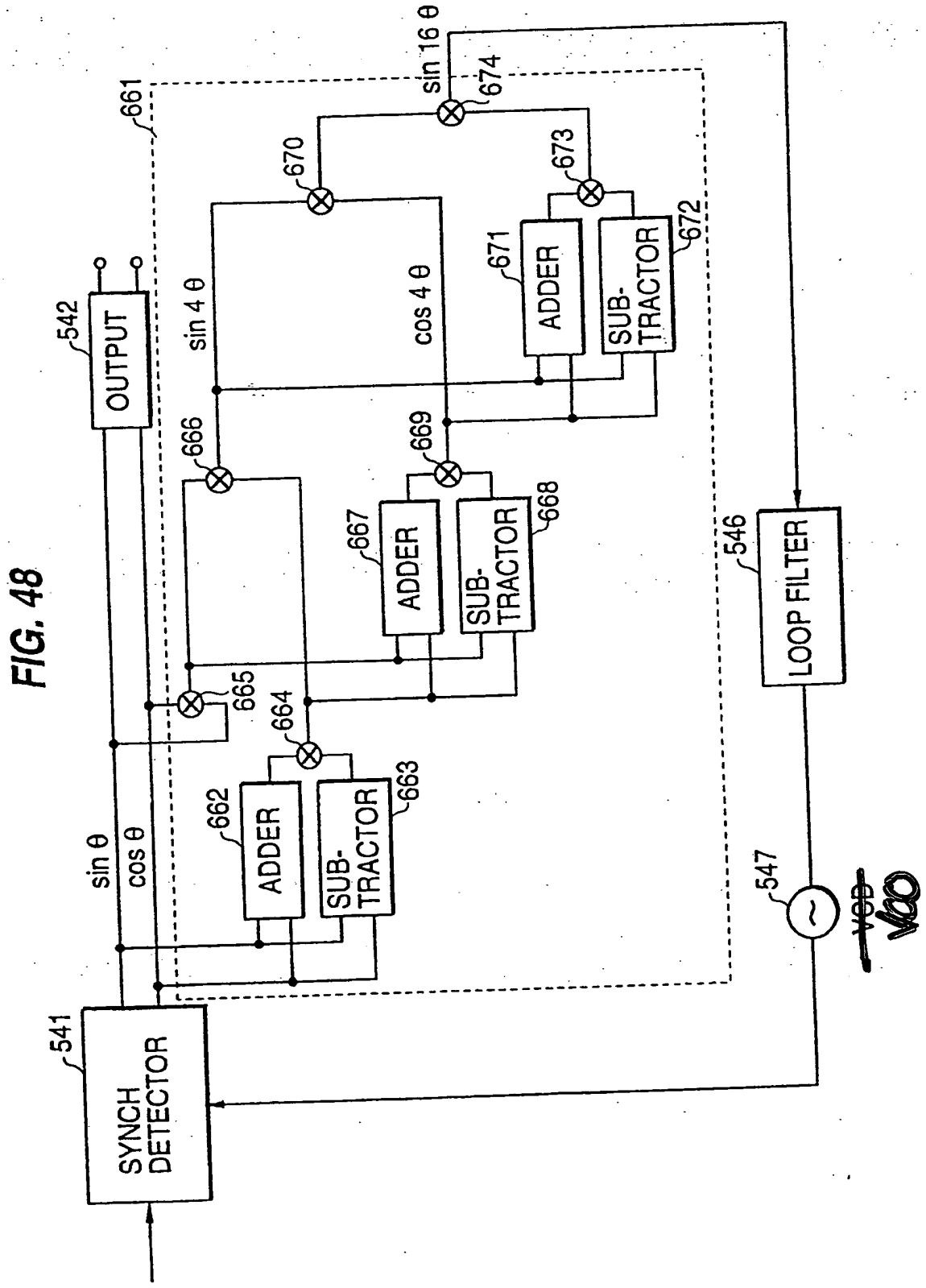

sin 16 θ
674
661
670
673
671
ADDER
672
SUB-
TRACTOR
542
OUTPUT
sin 4 θ
cos 4 θ
666
669
667
ADDER
668
SUB-
TRACTOR
546
LOOP FILTER
665
664
662
ADDER
663
SUB-
TRACTOR
sin θ
cos θ
547
VCO
541
SYNCH
DETECTOR

FIG. 48

FIG. 65

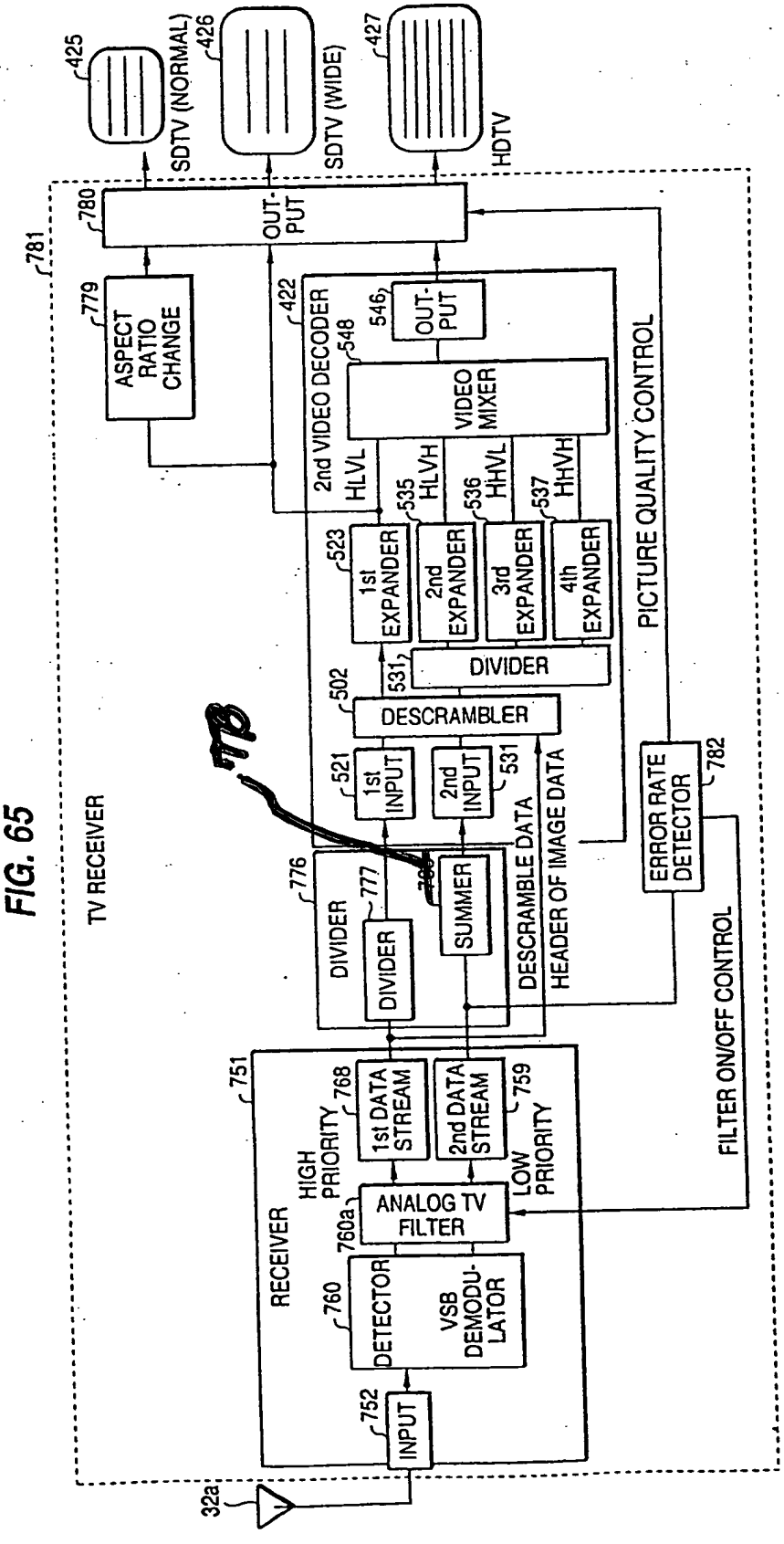
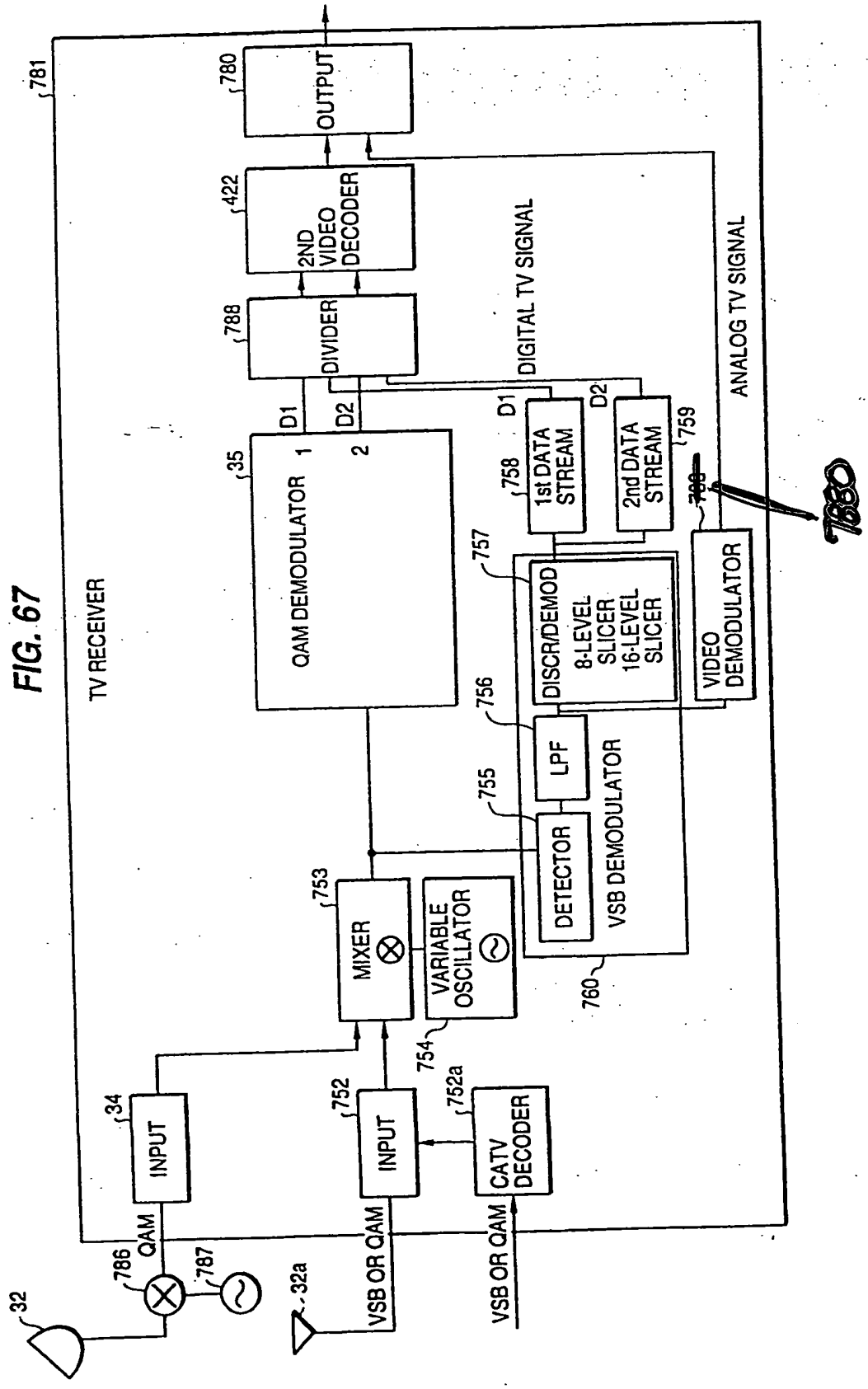

TV RECEIVER
781
425
SDTV (NORMAL)
426
SDTV (WIDE)
427
HDTV
780
OUT-PUT
779
ASPECT RATIO CHANGE
422
2nd VIDEO DECODER
546
OUT-PUT
548
VIDEO MIXER
HLVL
535 HLVH
536 HHVL
537 HHVH
523
1st EXPANDER
2nd EXPANDER
3rd EXPANDER
4th EXPANDER
531
DIVIDER
502
DESCRAMBLER
521
1st INPUT
2nd INPUT
531
PICTURE QUALITY CONTROL
782
ERROR RATE DETECTOR
776
DIVIDER
777
DIVIDER
SUMMER
DESCRAMBLE DATA
HEADER OF IMAGE DATA
FILTER ON/OFF CONTROL
751
RECEIVER
HIGH PRIORITY
768
1st DATA STREAM
2nd DATA STREAM
759
LOW PRIORITY
760a
ANALOG TV FILTER
760
DETECTOR
VSB DEMODU-LATOR
752
INPUT
32a

FIG. 67


TV RECEIVER
781
OUTPUT
780
2ND VIDEO DECODER
422
DIVIDER
788
DIGITAL TV SIGNAL
ANALOG TV SIGNAL
D1
D2
QAM DEMODULATOR
35
1st DATA STREAM
758
2nd DATA STREAM
759
760
757
DISCR/DEMOD
8-LEVEL SLICER
16-LEVEL SLICER
VIDEO DEMODULATOR
756
LPF
755
DETECTOR
VSB DEMODULATOR
MIXER
753
VARIABLE OSCILLATOR
754
INPUT
34
INPUT
752
CATV DECODER
752a
QAM
VSB OR QAM
VSB OR QAM
786
787
32
32a

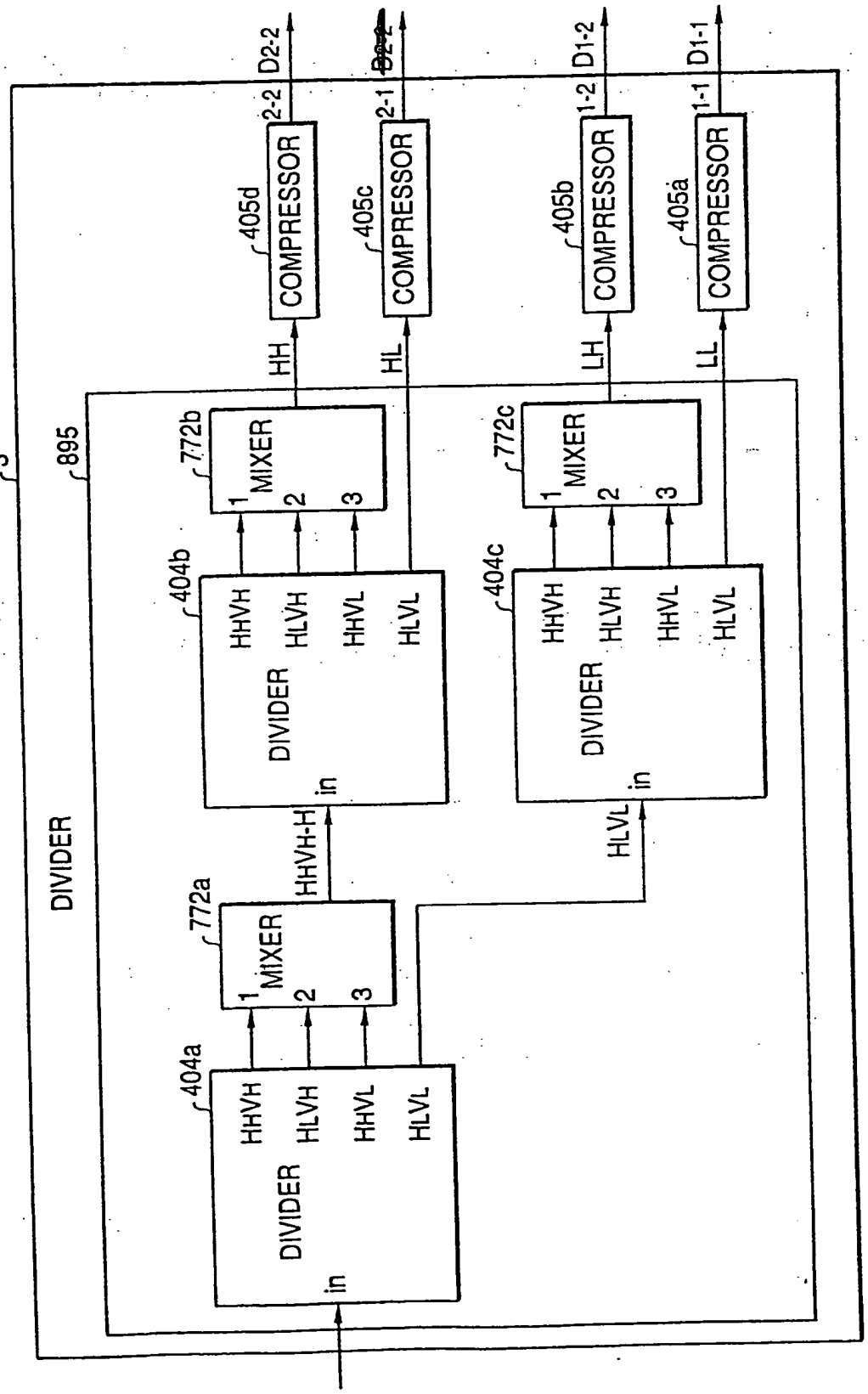
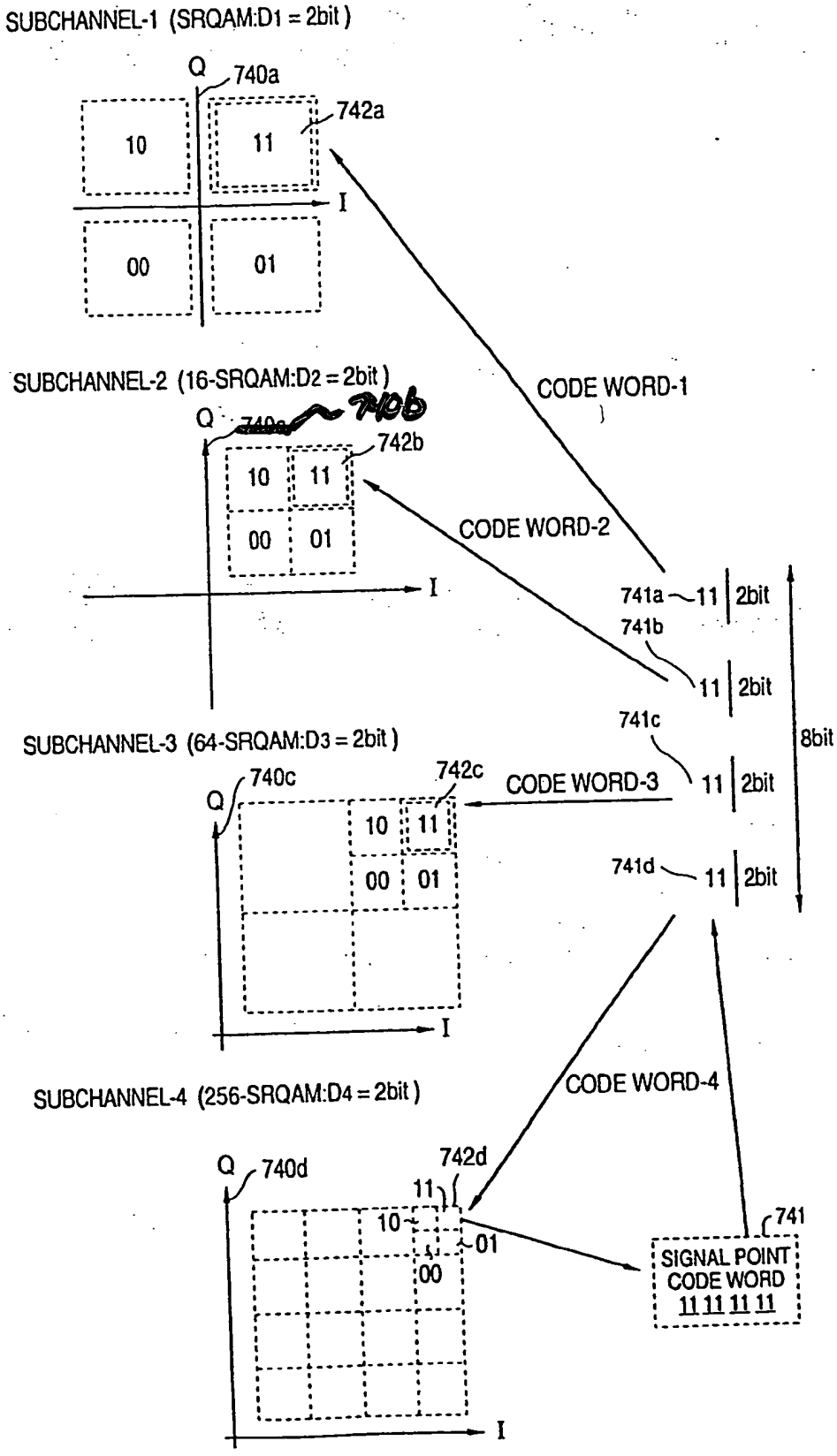

3
DIVIDER
895
772a
MIXER
1
2
3
HHVH-H
404a
DIVIDER
HHVH
HLVH
HHVL
HLVL
in
772b
MIXER
404b
772c
MIXER
404c
HH
HL
LH
LL
405d
COMPRESSOR
405c
405b
405a
2-2
2-1
1-2
1-1
D2-2
D2-1
D1-2
D1-1

FIG. 93

FIG. 112


SUBCHANNEL-1 (SRQAM:D1 = 2bit)
Q
740a
742a
10
11
I
00
01
SUBCHANNEL-2 (16-SRQAM:D2 = 2bit)
740b
742b
CODE WORD-1
CODE WORD-2
741a 11 2bit
741b
11 2bit
741c
11 2bit
8bit
741d 11 2bit
SUBCHANNEL-3 (64-SRQAM:D3 = 2bit)
740c
742c
CODE WORD-3
SUBCHANNEL-4 (256-SRQAM:D4 = 2bit)
CODE WORD-4
740d
742d
741
SIGNAL POINT
CODE WORD
11 11 11 11

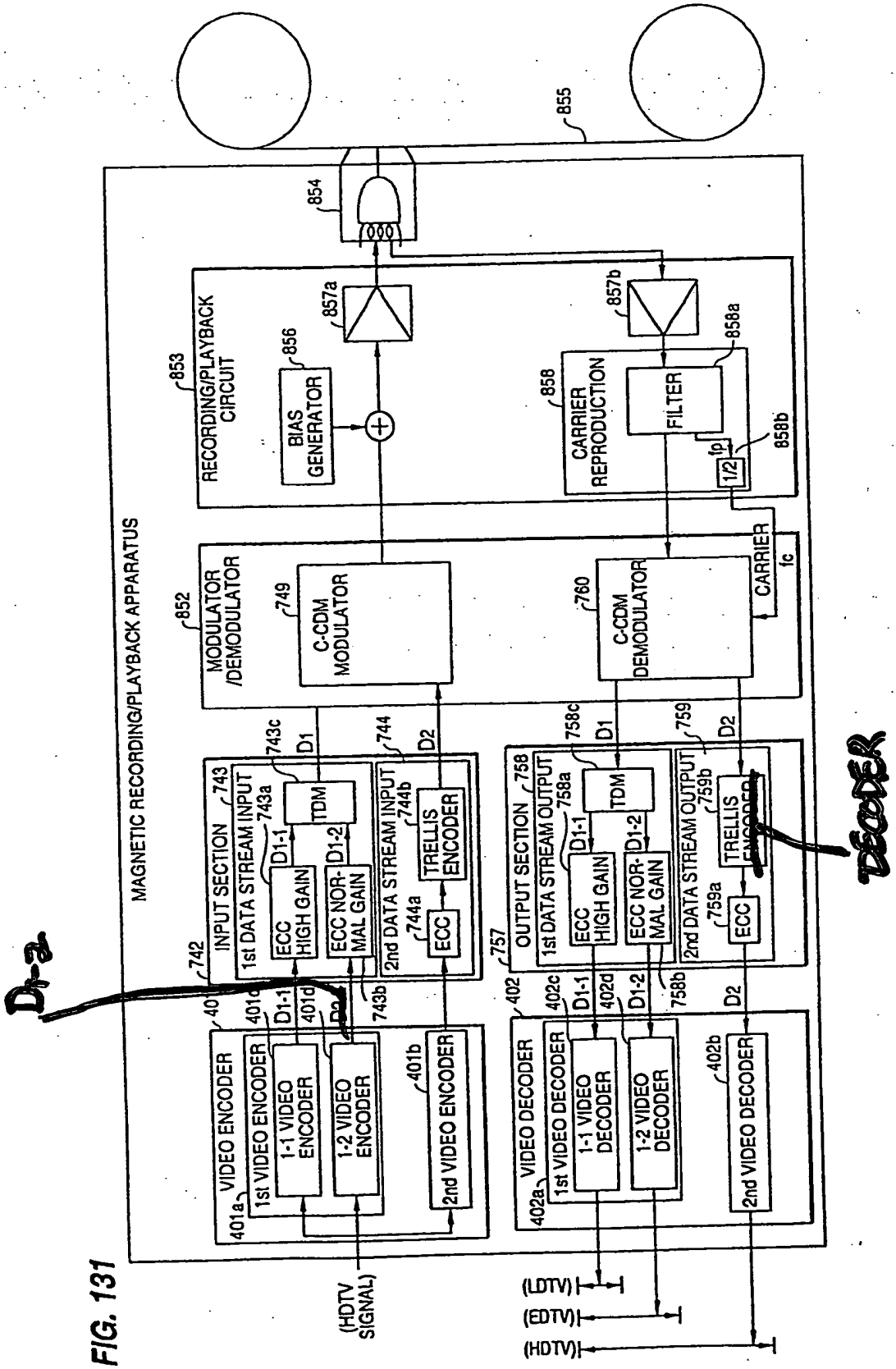

MAGNETIC RECORDING/PLAYBACK APPARATUS
855
854
853
RECORDING/PLAYBACK CIRCUIT
857a
857b
856
BIAS GENERATOR
858
CARRIER REPRODUCTION
FILTER
858a
858b
1/2
852
MODULATOR /DEMODULATOR
749
C-CDM MODULATOR
760
C-CDM DEMODULATOR
CARRIER
1c
743
INPUT SECTION
1st DATA STREAM INPUT
743a
743c
D1
744
2nd DATA STREAM INPUT
744b
D2
TDM
D1-1
D1-2
ECC HIGH GAIN
ECC NOR-MAL GAIN
TRELLIS ENCODER
744a
ECC
742
D2
758
OUTPUT SECTION
1st DATA STREAM OUTPUT
758a
758c
759
2nd DATA STREAM OUTPUT
759b
759a
757
40
401
VIDEO ENCODER
401a
1st VIDEO ENCODER
1-1 VIDEO ENCODER
1-2 VIDEO ENCODER
401b
2nd VIDEO ENCODER
401c
401d
743b
402
VIDEO DECODER
402a
1st VIDEO DECODER
1-1 VIDEO DECODER
1-2 VIDEO DECODER
402b
2nd VIDEO DECODER
402c
402d
758b
(HDTV SIGNAL)
(LDTV)
(EDTV)
(HDTV)

FIG. 131

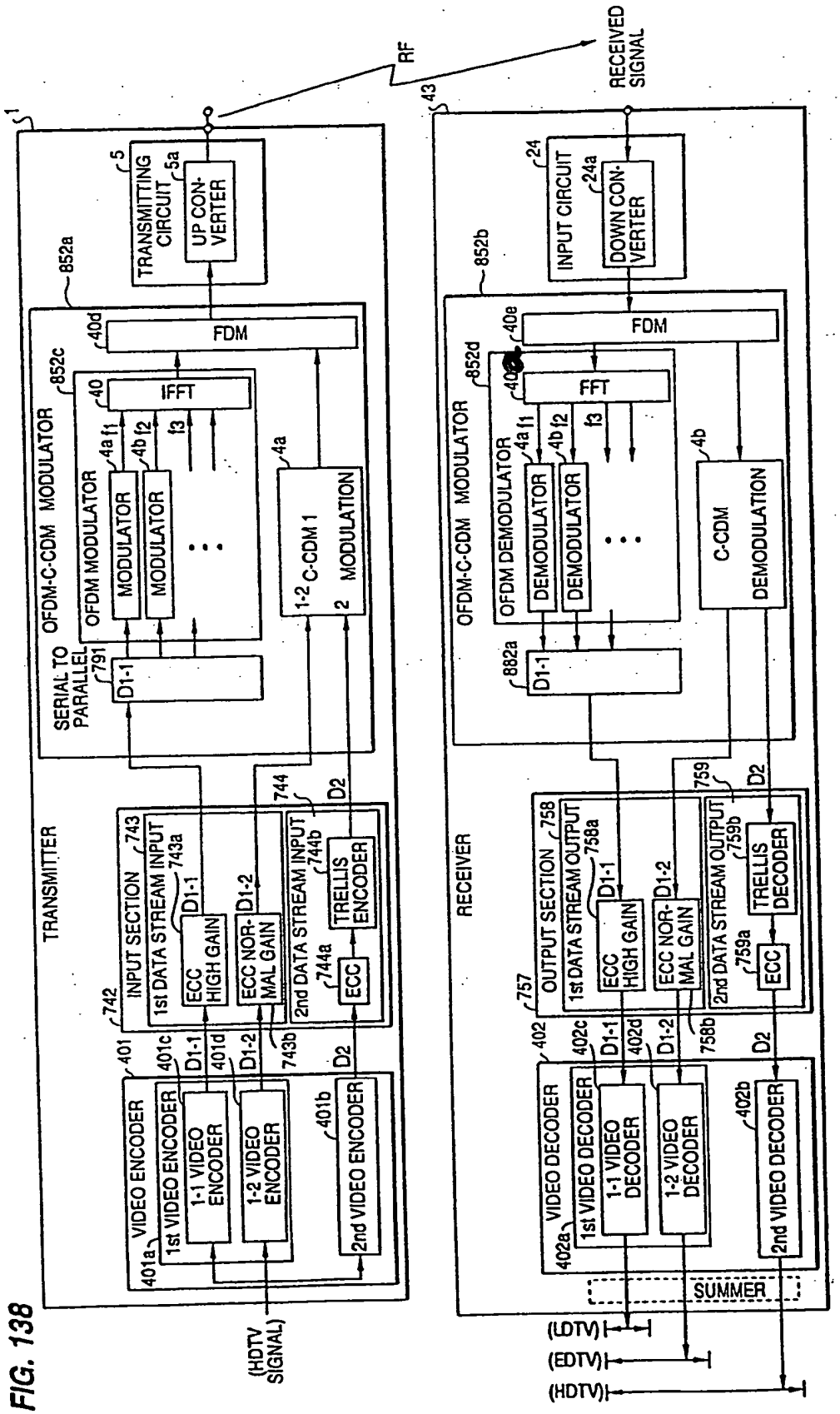

TRANSMITTER
RECEIVER
RF
RECEIVED SIGNAL
(HDTV SIGNAL)
(SDTV)
(EDTV)
(HDTV)
SUMMER
OFDM-C-CDM MODULATOR
OFDM-C-CDM DEMODULATOR
SERIAL TO PARALLEL
OFDM MODULATOR
OFDM DEMODULATOR
MODULATOR
DEMODULATOR
FFT
FDM
C-CDM
MODULATION
DEMODULATION
TRANSMITTING CIRCUIT
UP CONVERTER
INPUT CIRCUIT
DOWN CONVERTER
INPUT SECTION
OUTPUT SECTION
1st DATA STREAM INPUT
2nd DATA STREAM INPUT
1st DATA STREAM OUTPUT
2nd DATA STREAM OUTPUT
ECC
HIGH GAIN
ECC NORMAL GAIN
TRELLIS ENCODER
TRELLIS DECODER
VIDEO ENCODER
VIDEO DECODER
1st VIDEO ENCODER
2nd VIDEO ENCODER
1st VIDEO DECODER
2nd VIDEO DECODER
1-1 VIDEO ENCODER
1-2 VIDEO ENCODER
1-1 VIDEO DECODER
1-2 VIDEO DECODER

FIG. 138

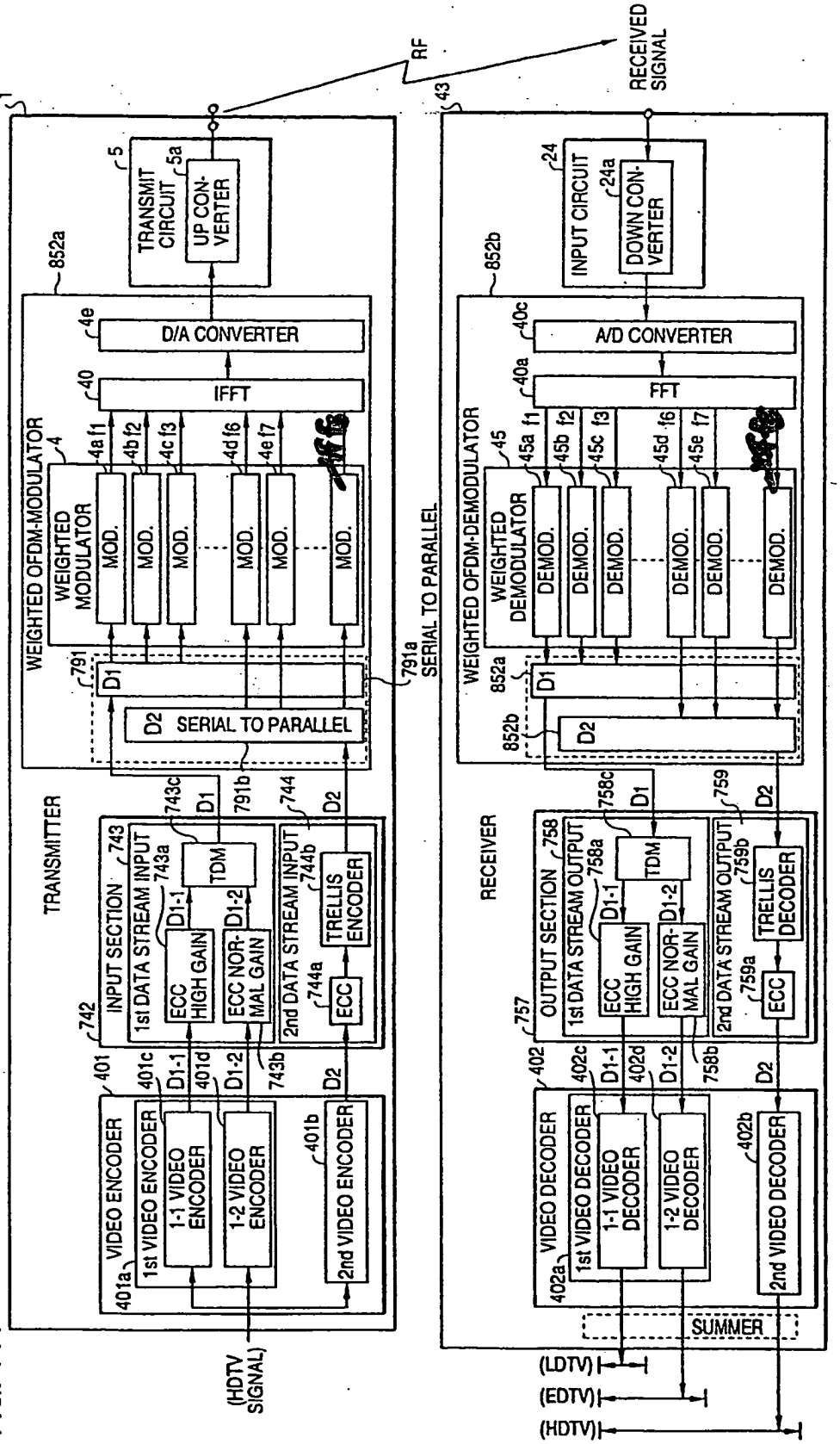

RF
RECEIVED SIGNAL
TRANSMITTER
RECEIVER
WEIGHTED OFDM-MODULATOR
WEIGHTED OFDM-DEMODULATOR
SERIAL TO PARALLEL
TRANSMIT CIRCUIT
UP CONVERTER
INPUT CIRCUIT
DOWN CONVERTER
D/A CONVERTER
A/D CONVERTER
IFFT
FFT
WEIGHTED MODULATOR
WEIGHTED DEMODULATOR
MOD.
DEMOD.
SERIAL TO PARALLEL
INPUT SECTION
OUTPUT SECTION
1st DATA STREAM INPUT
2nd DATA STREAM INPUT
1st DATA STREAM OUTPUT
2nd DATA STREAM OUTPUT
TDM
ECC HIGH GAIN
ECC NORMAL GAIN
TRELLIS ENCODER
TRELLIS DECODER
ECC
VIDEO ENCODER
VIDEO DECODER
1st VIDEO ENCODER
1st VIDEO DECODER
1-1 VIDEO ENCODER
1-1 VIDEO DECODER
1-2 VIDEO ENCODER
1-2 VIDEO DECODER
2nd VIDEO ENCODER
2nd VIDEO DECODER
SUMMER
(HDTV SIGNAL)
(LDTV)
(EDTV)
(HDTV)

FIG. 144

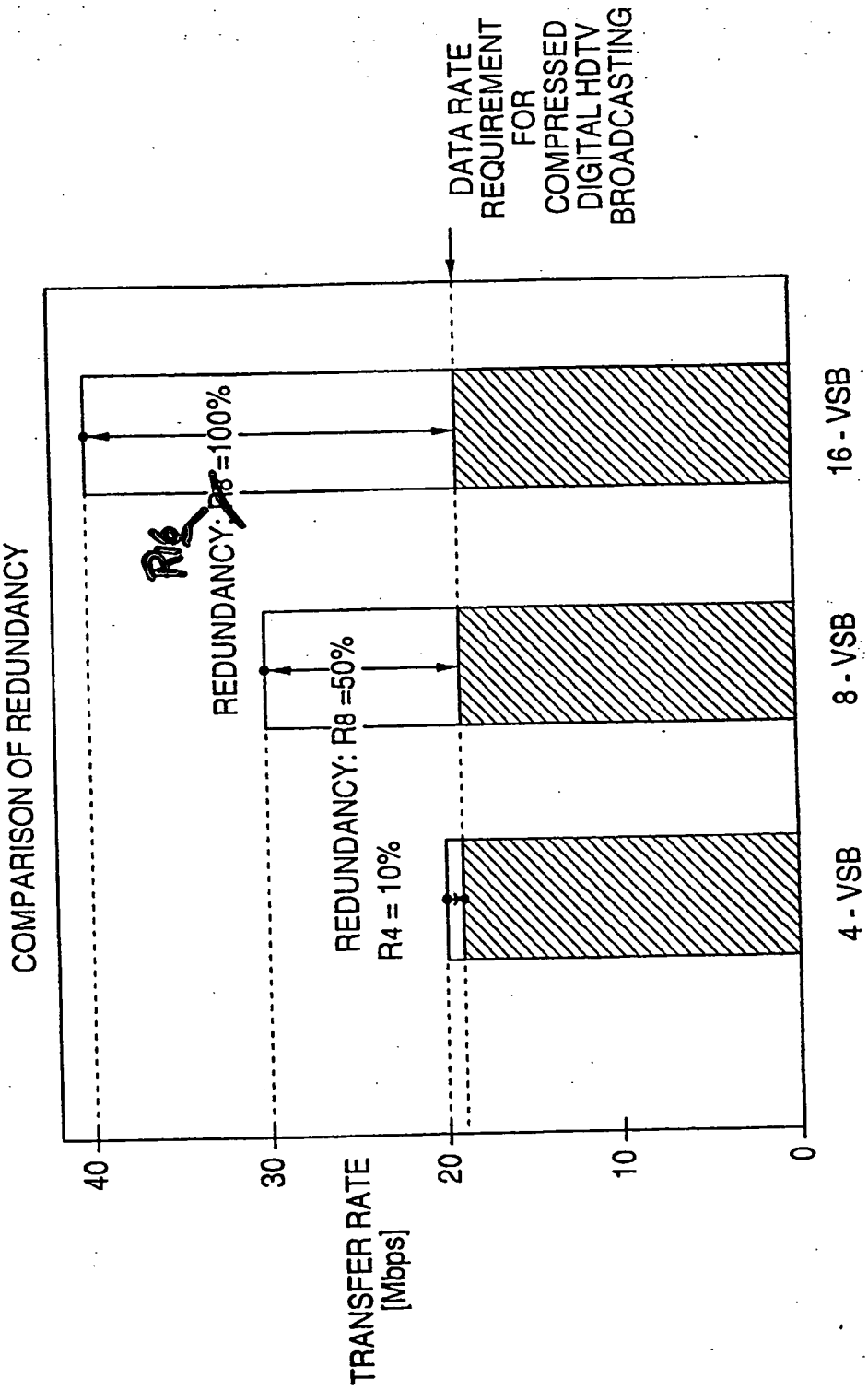

COMPARISON OF REDUNDANCY
DATA RATE REQUIREMENT FOR COMPRESSED DIGITAL HDTV BROADCASTING
REDUNDANCY: R8 =100%
REDUNDANCY: R8 =50%
REDUNDANCY: R4 = 10%
R4 = 10%
16 - VSB
8 - VSB
4 - VSB
TRANSFER RATE [Mbps]
40
30
20
10
0

FIG. 169